NASTEL
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Nastel Navigator
Workgroup Server Expert
Installation Guide
Version 10

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Chapter 1: Introduction

Welcome to the *Nastel Workgroup Server (WGS) Expert Installation Guide*. This guide describes installation, configuration, and deployment. Please review this guide carefully before installing and using the product.

The Workgroup Server Expert (WSE) is a Java plug-in to the AutoPilot (AP) M6 Complex Event Processor (CEP), combining the functionality of the AutoPilot M6-WMQ Workgroup Server (WGS) and an AP M6 expert (for information on experts, see section 4.5 Experts, in the *Nastel AutoPilot M6 User's Guide*). The WGS discovers the objects of your IBM MQ and TIBCO EMS networks, stores that information in a database, and makes it available to client applications, such as the Nastel Navigator (formerly, the APWMQ Explorer). In addition, the expert component optionally publishes the object information as facts, which are visible in the Enterprise Manager console and can be used in the formation of AP policies and business views. See Section 4.1, *Migrating from WGS 6 to WGS 10*, that explains the differences between WGS 6 versions and 10.

1.1 How this Guide is Organized

Chapter 1: Introductory information as well as support and reference information.

Chapter 2: Provides licensing information for the WGS Expert.

Chapter 3: Provides installation requirements and instructions.

Chapter 4: Provides database configuration information.

Chapter 5: Provides instructions for deploying the WGS Expert.

Chapter 6: Provides installation instructions for Nastel Navigator's Scheduler.

Chapter 7: Discusses fact publishing and behavior.

Chapter 8: Troubleshooting topics.

Appendix A: A list of reference material and documents.

Appendix B: A list of typographical conventions.

Index: Alphanumeric listing of all topics and subjects of importance.

1.2 History of this Document

Table 1-1. Document History

Release Date	Document Number	Version	Summary
April 2017	AP/WGS 101.001	10.1.0.1	Initial release.
February 2019	AP/WGS 101.003	10.1.1.0	Added install information for Nastel Navigator's Scheduler. Update license information in section 2.2.1.
March 2019	AP/WGS 101.004	10.1.1.0	Update Figure 1-1.
May 2019	AP/WGS 101.005	10.1.1.0	Name updates, rearrangement of chapters 4 and 5 and add information about migrating from WGS 6 to WGS 10.
June 2019	AP/WGS 101.006	10.1.1.0	Update link in 2.1. Update content of first troubleshooting issue in Chapter 9.
July 2019	AP/WGS 101.007	10.1.1.0	Remove Chapter 8, Controlling Facts Published in WGS10

July 2019	AP/WGS 101.008	10.1.1.0	Add section 4.3 (WGS 10 Database Configuration for Oracle). Update "Database URL" description in Table 5-1. Update "Permits Database URL" description in 5-3.
July 2019	AP/WGS 101.009	10.1.1.0	Update “Oracle” description for “Database URL” in Table 5-1 and “Permits Database URL” in Table 5-3.
September 2019	AP/WGS 101.010	10.1.1.0	Update Figure 1-1.
November 2019	AP/WGS 101.011	10.1.1.0	Added Figure 7-2. Updates to figure 4.2. Moved content 4.3 (Configuring for Oracle Database) to section 4.2.
January 2020	NAV/WGS 101.012	10.1.1.0	Change “APMW” to “Nastel Navigator” throughout doc. Update year and document number format.

1.3 Related Documents

Related and referenced documents can be found in Appendix A.

1.4 Release Notes

See the **`README.htm`** files on your installation media or Workgroup Server Expert installation directory. Release notes and updates are also available through the Nastel Resource Center at: http://customers.nastel.com.

1.5 Intended Audience

This document is intended for personnel installing, configuring, and using Workgroup Server Expert.

1.5.1 User Feedback

Nastel encourages all users of Workgroup Server Expert to submit comments, suggestions, corrections, and recommendations for improvement of this documentation. Please send comments via email to: support@nastel.com. You will receive a response, along with status of any proposed change, update, or correction.

1.6 Technical Support

If you need additional technical support, you can contact Nastel by telephone or by email. To contact Nastel technical support by telephone, call **800-963-9822 ext. 1**. If you are calling from outside the United States, dial **001-516-801-2100**.

To contact Nastel technical support by email, send a message to support@nastel.com. You can also contact Nastel support via the support website. To access online web-based Nastel automated support system (user ID/Password required), go to: http://support.nastel.com/.

1.7 Conventions

Refer to Appendix B for typographical and naming conventions used in this guide.

1.8 AutoPilot M6 for Nastel Navigator Installation Support

See Figure 1-1 for AutoPilot M6 for Nastel Navigator Installation Support. This platform is for the Workgroup server and databases supported. Agents may be available for other versions of operating systems and middleware versions. You should contact their support representatives if your platform is not listed.

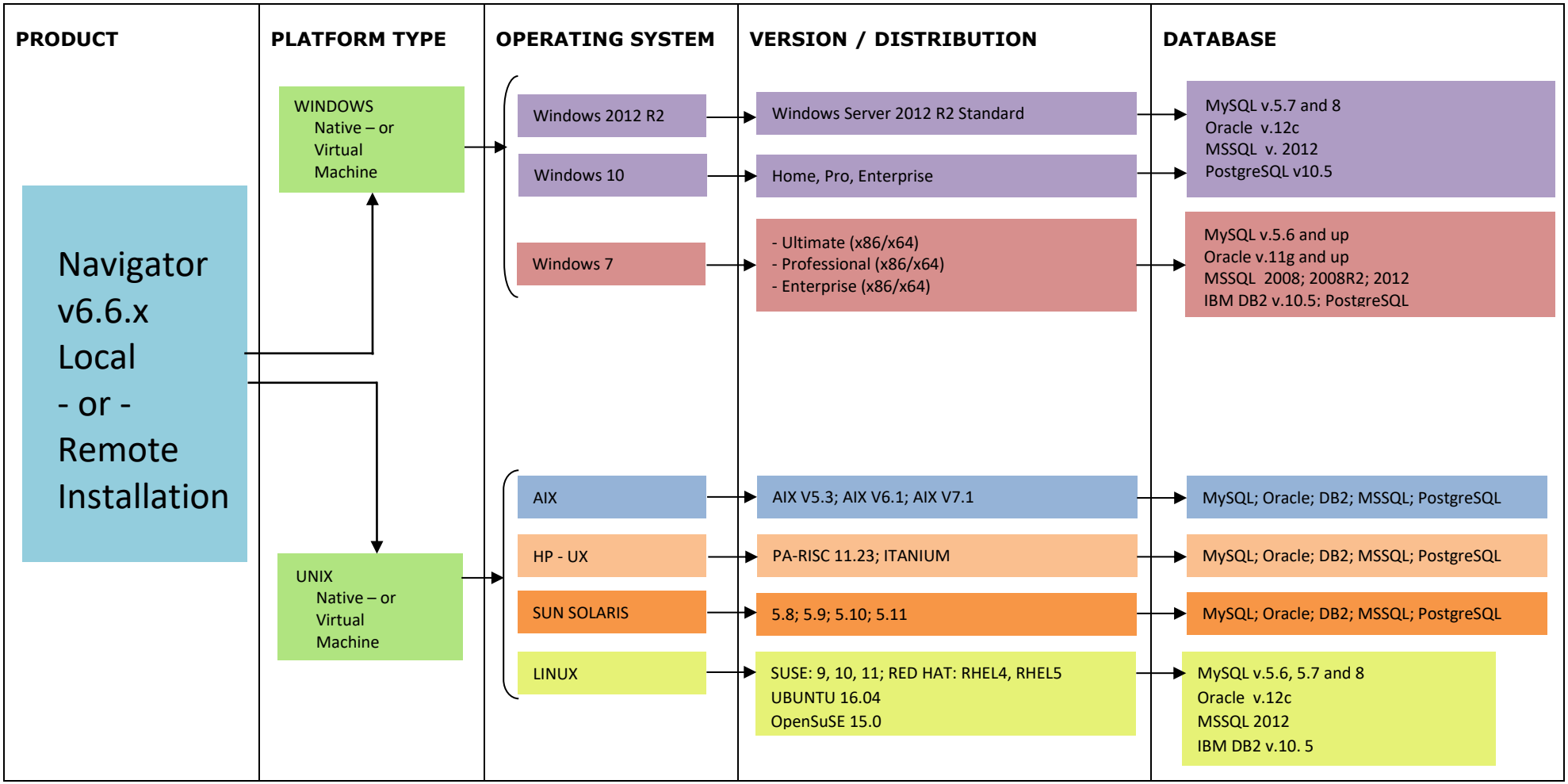

Figure 1-1. AutoPilot M6 for Nastel Navigator Installation Support

Chapter 2: Before Installation

This chapter contains general information related to the preparation for and installation of the Workgroup Server Expert. Refer to the file `README_INSTALL.txt` on the installation media for pertinent information.

2.1 Workgroup Server Expert Installation Materials

The Workgroup Server Expert is installed from either installation media or from http://data.nastel.com/ap/AutoPilot-M6 (credentials required).

2.2 Workgroup Server Expert License

Before you start, you need to obtain a CPU-based license file and install it on each system on which a workgroup server will run. The CPU count is pre-allocated and subject to change. Contact your sales manager for further information pertaining to trial license properties.

A workgroup server license is a digitally-signed text file that contains identification and license entitlement information for your Workgroup Server Expert installation. Each time the workgroup server is started, it checks the license file for your licensing and configuration information.

To obtain a license file:

1. Navigate to **Start > Programs > Nastel AutoPilot M6 for WMQ > Request License** or go directly to http://www.nastel.com/purchase-software_481_51.html.
2. Follow the procedure indicated to receive a license file(s). The license files must be installed. Refer to section 2.2.1, Installing the Workgroup Server Expert License File.

NOTE

1. The workgroup server will not run without a correctly configured license file.
2. A new license is required for Version 10.1.0.1 and above. It is required for users of Nastel Navigator and users running agents on z/OS.

2.2.1 Installing the Workgroup Server Expert License File

When you receive your license file, back it up in a safe place in case you ever need to reinstall Workgroup Server Expert. For the system that will run the workgroup server identified in the license file, we recommend you copy the license file to the directory:

`[AUTOPILOT_HOME]\localhost`

where:

`[AUTOPILOT_HOME]` is the directory path where AutoPilot is installed.

After the Workgroup Server Expert is deployed, you must enter the full path location name of the license file in the expert's properties dialog box. *(See Figure 5-2, Create Workgroup Server Expert – General Tab.)*

NOTE

The name of the license file must be AutoPilotWMQ_xyz.lic, where xyz is the name of the workgroup.

You can check the license file information by starting your Workgroup Server Expert and checking the AutoPilot logs (`[AUTOPILOT_HOME]\logs\log4j\hostname.log4j`).

The workgroup server will return the licensing information, similar to the following example:


```
LICENSING INFORMATION:
   SOURCE(C:\nastel\AutoPilotM6\localhost\AutoPilotWMQ_MQM.lic)
   WORKGROUP(MQM)
   FEATURES(SQLDB)
   EXPERT(YES)
   WORKGROUP_HOSTS(host)
   CPU_COUNT(14)
   USER_COUNT(10)
   AGENTLESS_CONNECTION_COUNT(250)
   APOD_WMQ_USERS(100)
   MIPS(0)
   EXPIRATION_DATE(Fri Jun 10 00.00.00 2016)
```

where:

SOURCE is the full path location name of the license file.

WORKGROUP name of the workgroup authorized for this license.

FEATURES is a list of licensable features (Kerberos, SQLDB, TopologyView) that the user is authorized to use.

EXPERT *yes* indicates a license is for Workgroup Server Expert.

WORKGROUP_HOSTS is a list of network hosts that the workgroup server is licensed to run on.

CPU_COUNT is the maximum number of system processors that can be simultaneously managed by a single workgroup server.

USER_COUNT is the maximum number of client users that can simultaneously connect to a single workgroup server via the Navigator Explorer, Message Server, and/or AutoPilot M6.

AGENTLESS_CONNECTION_COUNT is the maximum number of concurrent queue manager connections allowed by Connection Manager.

APOD_WMQ_USERS number of users that can simultaneously use the web-based Navigator (formerly AutoPilot On-Demand for WMQ).

MIPS (millions of instructions per second) number of MIPs for which z/OS nodes can be managed.

EXPIRATION_DATE is the date on which the license expires and a new license will have to be obtained.

Chapter 3: Installation

This chapter provides installation requirements and instructions.

3.1 Components

The latest WGS_10.x.pkg file contains the following components:

- lib\wgsexpert.jar
- lib\nsqjdbcmk.jar
- sql\scripts\nsqjdbcmk\{various sql scripts}.sql.

3.2 Installation Requirements

In order to install the product, the following pre-requisite product must be installed:

- AutoPilot M6 CEP Server.

3.2.1 Hardware Requirements

Minimum:

- 1 GHz or higher CPU
- 2 G RAM
- 1 G free disk space

Recommended:

- 2 CPUs 8 core each
- 8 G RAM
- 10 G free disk space

3.2.2 Database Management

Supported Databases

Workgroup Server Expert supports the databases in Figure 1-1.

NOTE SQL database should be highly available.

Operation Without Database Connectivity

A database connection is needed. Without one, the workgroup server will continue limited monitoring, but will not allow any further WGS Expert modifications after the database connection failure. The WGS Expert will still report any events generated by Navigator, but the events will not be logged to the database and the event history will not be available. The events included are:

- Queue manager start/stop
- Performance
- Channel
- Command

Alter- and discovery-related events will not be reported.

3.3 Installation

To install Workgroup Server Expert, do the following:

1. Copy the package file to `[AUTOPILOT_HOME]/updates` on the server where AP M6 is installed.
2. Stop the AutoPilot M6 services: CEP Server, Web Server and Domain Server.
3. You must have installed minimally AP 6.0 Service Update 27 (AP60_SU27). If not, download and install the required packages, namely, all packages AP60_SUnn.pkg, where "nn" is 1 greater than the current SU version shown in your package manager display.
4. If this is a first-time installation of Workgroup Server Expert, run package manager to install the pre-requisites and the expert, otherwise continue to Chapter 4.

   For example:

   `[AUTOPILOT_HOME]/bin/pkgman [AUTOPILOT_HOME]/updates/WGS_<version>.pkg`

   Alternatively, on a Windows system, run the package manager GUI by going to **Start** > **Nastel AutoPilot M6** > **M6 Product Maintenance**. Click **Install**, select the package in the **Updates** folder, and click **Open**.

Chapter 4: WGS Expert Database Configuration

If migrating from WGS 6 to WGS 10, read section *4.1, Migrating from WGS 6 to WGS 10*. If this is first-time installation or upgrading to later version of WGS Expert, skip to section 4.2, *First-time WGS 10 Database Configuration and Upgrading of WGS Expert 10.1.1.x* .

4.1 Migrating from WGS 6 to WGS 10

Existing customers will want to migrate to WGS 10 to take advantage of its improved performance and other features. WGS 10 is designed to be compatible with WGS 6 clients. That means it is not necessary to immediately convert your client software including the MQ or EMS agents. However, the WGS, the database tables and the Navigator web apps should be at matching versions.

The following table displays some of the key differences between WGS 6 and WGS 10.

Table 4-1. Differences Between WGS 6 and WGS 10

WGS 6	WGS 10
Written in C and C++ with some threading.	Written in Java with extensive multi-threading.
Runs as a standalone application.	Runs within an AutoPilot CEP container.
Uses ODBC to connect to the database.	Uses JDBC to connect to the database.
Multiple experts are used to sample data and publish as facts in AutoPilot M6.	Can publish many facts directly (experts are still compatible).
Configuration options are set as run time parameters and configuration files.	Configuration options are set in dialog properties.
Installed using a self-extracting installer and maintained via zip update.	Installed and maintained using AutoPilot package manager.

The first step in migration is **planning**, while the WGS is compatible with existing clients, there are changes to the infrastructure required. Specifically, the database tables (**nastel_apwmq**) for the WGS 10 are different than those used by WGS 6. A one-time migration option is provided which converts the table formats. Once completed, the WGS 6 will not be compatible with these tables. It is not possible to run multiple WGS instances sharing the same database schema at different version levels. If you want to migrate some but not others, two database schemas are required.

The permissions database tables (**nastel_permv3**) are completely compatible between WGS 6 and WGS 10 and can be shared by two WGS's at different versions.

For an initial installation and test, you may want to install the tables in a completely independent database to avoid any impact to the existing configuration. Once you are familiar with the concepts, the migration for existing WGS instances will be simplified.

The following process can be used to migrate the **nastel_apwmq** database schema, for customers running 6.6.0 or later. For customers running earlier versions, you must upgrade to 6.6.0 first before following these instructions.

1. Stop all AutoPilot components.
2. Unzip the latest version of AutoPilot for Middleware (6.6.4.2 for example, M6WMQ_6.6_WIN_x86_EF4.2.zip).
3. Use pkgman to install the WGS 10 package that matches with the WGS 6 version that you had previously installed. This will be found in the *[APWMQ_HOME]* folder and named **WGS_10.1.0.x.pkg**. The following is a list of versions:

Table 4-2. Package Names	
WGS 6 Version	**WGS 10 Package**
6.6.0	10.1.0.2
6.6.1	10.1.0.5
6.6.2	10.1.0.7
6.6.3	10.1.0.8
6.6.4	10.1.1.0 Migration requires special processing, contact Nastel support

4. Use pkgman to install the appropriate WGS Resource Pack (**WGSRP_10.x.x.pkg**), which will be found in the same folder.
5. Configure `[AUTOPILOT_HOME]/sql-scripts/nsqjdbcmk/nsqsqlmk.properties` to point to the database instance and schemas you want to upgrade.
6. This step will migrate the database from WGS 6.6.x to WGS 10.1.0.x:
   Run `[AUTOPILOT_HOME]/sql-scripts/nsqjdbcmk.(bat or sh)`
   a. Select option 0 to migrate nastel_apwmq and nastel_permv3
7. Use pkgman to install the latest WGS package (**10.1.1.x.pkg**)
8. This step will migrate the database from WGS 10.1.0.x to WGS 10.1.1.x:
   Run `[AUTOPILOT_HOME]/sql-scripts/nsqjdbcmk.(bat or sh)` again
   a. Select option 2 to upgrade **nastel_apwmq**
   b. Select option 4 to upgrade the **nastel_permv3**
9. Restart the AutoPilot components, except **nsqmgr** which is no longer needed.
10. Start Enterprise Manager and configure the WGS Expert properties as outlined in Chapter 5, Deploying the Expert and Configuring Expert Properties:
    a. WGS name
    b. WGS port
    c. Database settings
    d. Security options
11. In the WGS facts, under DBStats, confirm that the WGS is connected and that the expected schema is shown. If you see a mismatch, contact Nastel support for assistance.
12. If you were using WMQ experts and the WS_Monitor, you can stop them to avoid generating redundant facts and the associated processing overhead.

4.2 First-time WGS 10 Database Configuration and Upgrading of WGS Expert 10.1.1.x

Installing the WGS package will install the new database utility **nsqjdbcmk** which can be found under `[AUTOPILOT_HOME]/sql-scripts/nsqjdbcmk`. The utility will be used to create an initial WGS database or to upgrade an existing installation with 10.1.1.x to a later version, 10.1.1.y.

The utility will create or upgrade Navigator database objects and Permits database objects, define additional workgroups in the Navigator database, and add default Navigator records.

Before running **nsqjdbcmk:**

1. Using your database administrator tool, such as MySQL Workbench, create a Nastel Navigator database schema, for example 'nastel_apwmq or 'nastel_apwmq10', and enter it in the **nsqjdbcmk.properties** file.
   Example: nsqjdbcmk.apwmq.schema = nastel_apwmq10
2. If you will be using M6-MW command authorization, create a permits database schema, for example 'nastel_permv310', and enter it in the properties file.
   Example: nsqjdbcmk.permits.schema = nastel_permv310
3. Define environment variable `APWMQ_HOME` on the command line if it's not already defined. If Nastel Navigator is installed on the local AP M6 server, the variable is already defined. Otherwise, you can create directory `[AUTOPILOT_HOME]/config/groups` and set `APWMQ_HOME` to that directory and create an empty file **mqroup.ini** in the directory. Utility **nsqjdbcmk** will write workgroup information to the file, to be used by any Nastel Navigator clients that will run on this server.

To run the new utility, you will run the **nsqjdbcmk.bat** script file, but first you will want to open the **nsqjdbcmk.properties** file, shown below, and configure it. All fields have a brief description or are self-explanatory.

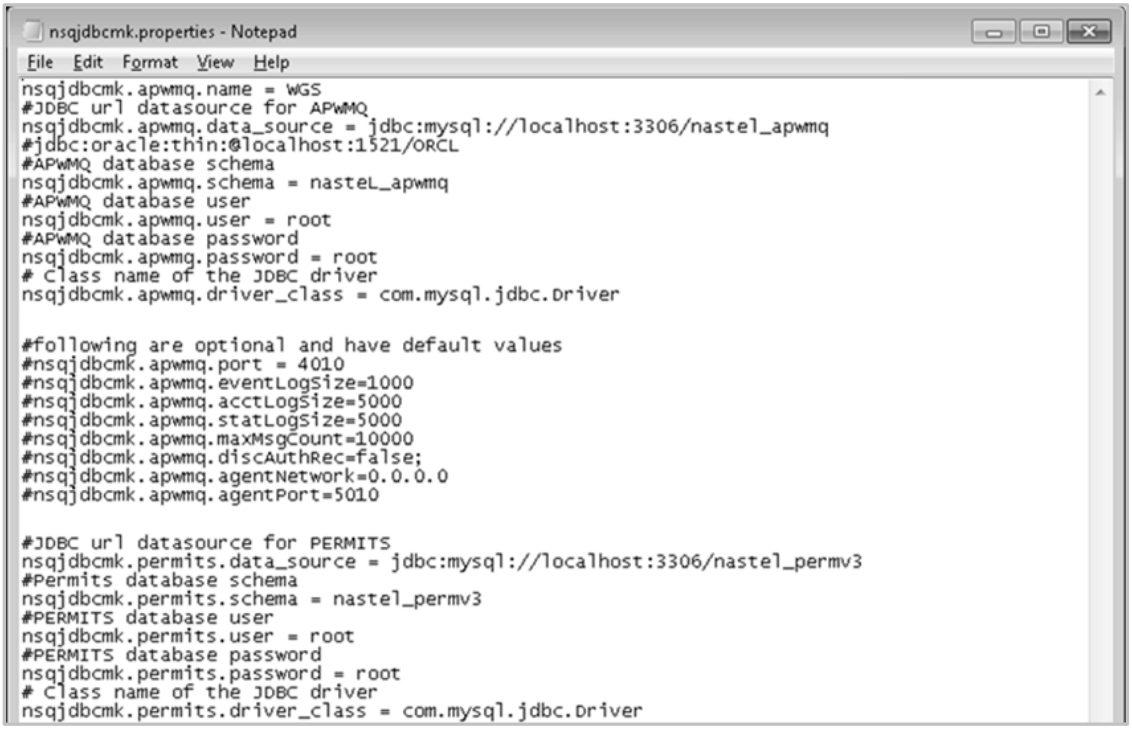

Figure 4-1. nsqjdbcmk Properties

The section under **#JDBC url datasource for PERMITS** is used for storing security configuration.

The optional values under **#following are optional and have default values** can be overridden if you remove the hash sign comment character '#' on each line that you want to change. For example, if you want a different default port you would change:

#nsqjdbcmk.apwmq.port = 4010

to

nsqjdbcmk.apwmq.port = 4011

Configuring for Oracle Database

If using an Oracle database, the required Oracle JDBC driver is included in the AutoPilot M6 installation. Configure the nsqjdbcmk.properties file as shown in figure 4-2. Define either the Oracle SID or SERVICENAME URL, not both, for the two data sources.

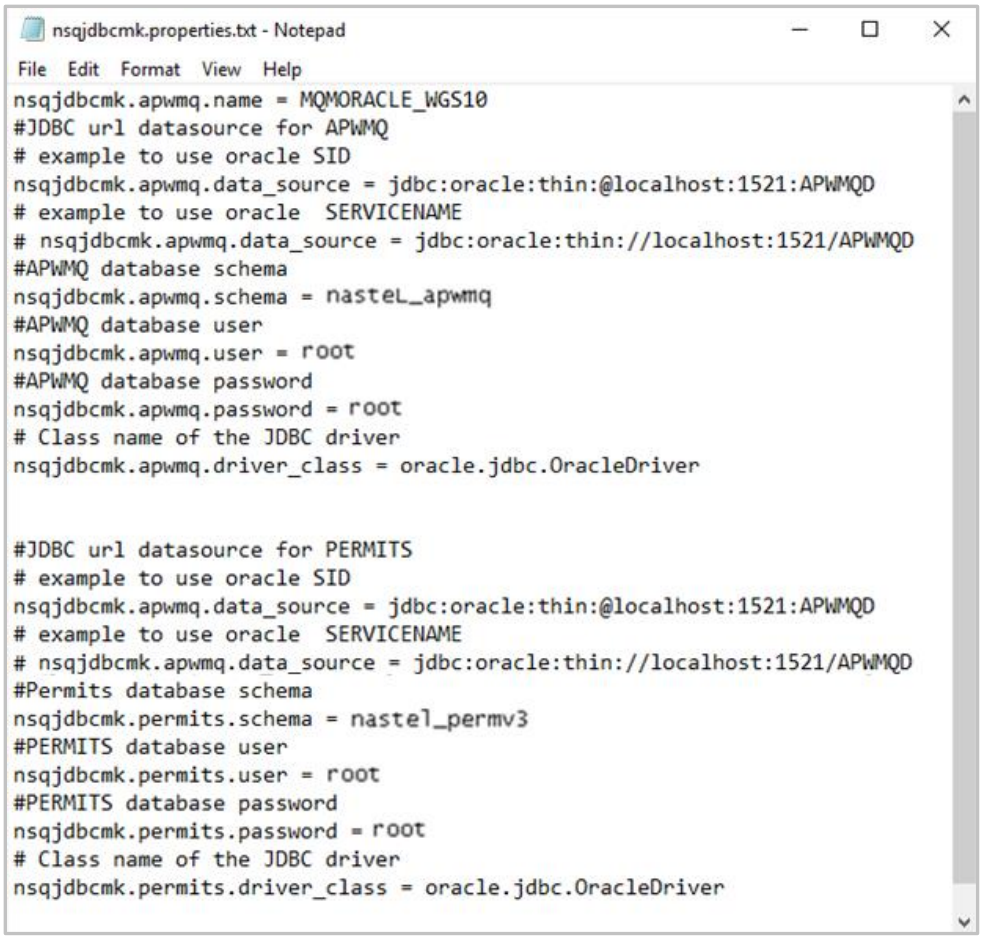

Figure 4-2. nsqjdbcmk.properties - Oracle

After you configure and save your changes to **nsqjdbcmk.properties**, you can run **nsqjdbcmk.bat** (or .**sh**) by changing the directory to `[AUTOPILOT_HOME]/sql-scripts/nsqjdbcmk` then running **nsqjdbcmk.bat** on the command prompt.

You will see the **nsqsqlmk** options listed below.

```
        NASTEL DATABASE DEFINITIONS
        ===========================
    0. Migrate from 6.6.X (nsqmgr) M6-WMQ Database
    1. Create M6-WMQ Database Objects
    2. Upgrade M6-WMQ Database Objects
    3. Create PERMITS Database Objects
    4. Upgrade PERMITS Database Objects
    5. Define additional workgroups in M6-WMQ Database
    8. Add default M6-WMQ records, NOT to be used with option 1
       (When creating the M6-WMQ tables manually, this is needed)
   10. Quit
Please select the option: __
```


For MySQL users, if the below error message appears when running options 1 or 3, the 5.1.26 version of the installed JDBC driver file, [AUTOPILOT_HOME]\lib\mysql-connector.jar, may not be compatible with your MySQL database installation, especially MySQL Server 8.0 or later. Save the current driver and replace with a newer, compatible JDBC driver, such as 5.1.45.

```
com.mysql.jdbc.exceptions.jdbc4.MySQLNonTransientConnectionException:
Could not create connection to database server
```

After the utility completes, file `[APWMQ_HOME]\config\groups\mqgroup.ini` has been created or updated with the group information extracted from **nsqjdbcmk.properties**.

For example:

```
Group::MQEVENT=MQM
Group::MQM=MQM
MQM::Node=127.0.0.1
MQM::Service=4011
```

Please review this file for possible manual editing.

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Chapter 5: Deploying the Expert and Configuring Expert Properties

If you are an IBM MQ customer and want to use the set of experts, see the *AutoPilot M6 Plug-in for IBM MQ* book. This book discusses how to install the IBM plugin and resource pack which creates the expert and associated policies. If you use the resource pack, you do not need to deploy the expert but you will still need to review the following section which covers settings you may need to change such as the data URL and passwords.

Follow the steps below to deploy the expert manually.

> **NOTE** Only one instance of the Workgroup Server Expert can be deployed to a CEP Server. If you want to run two instances of the Workgroup Server Expert, then you need to run two different instances of the AutoPilot CEP Server, each with one instance of Workgroup Server Expert.

1. Restart the AutoPilot M6 services: Domain Server, Web Server and CEP Server.

   Start the AutoPilot M6 Enterprise Manager.

2. Right-click on the AP M6 server icon and select **Deploy Expert**.

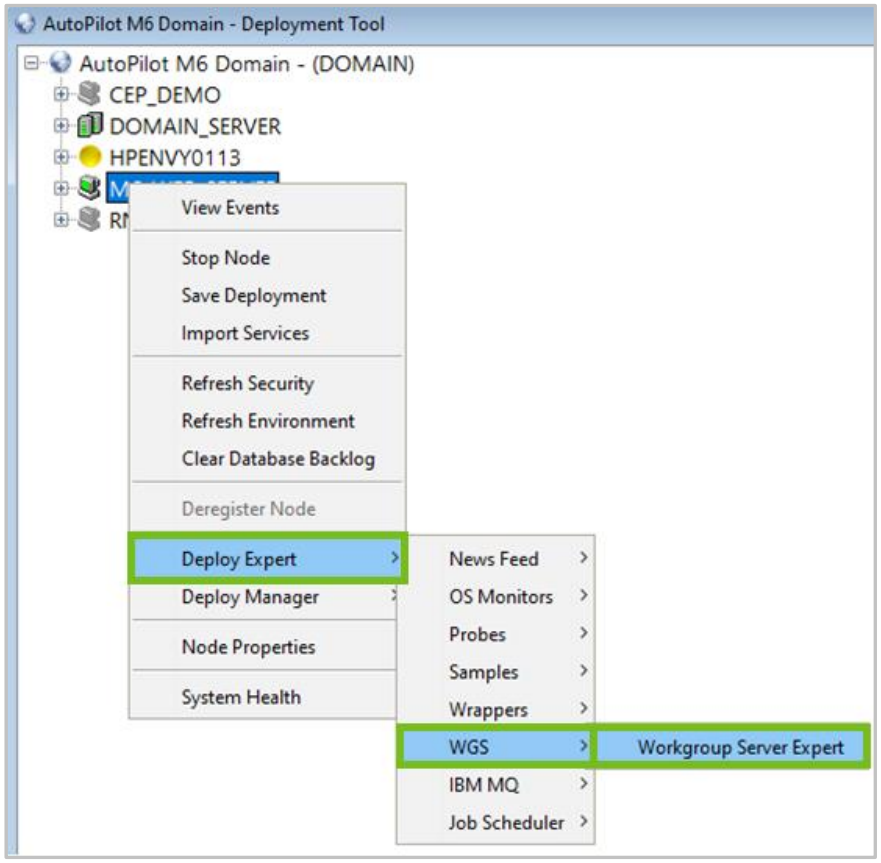

Figure 5-1. Deploy Expert Menu

3. The *Create Workgroup Server Expert – General* dialog box is displayed. Edit properties described in the table below, as required.

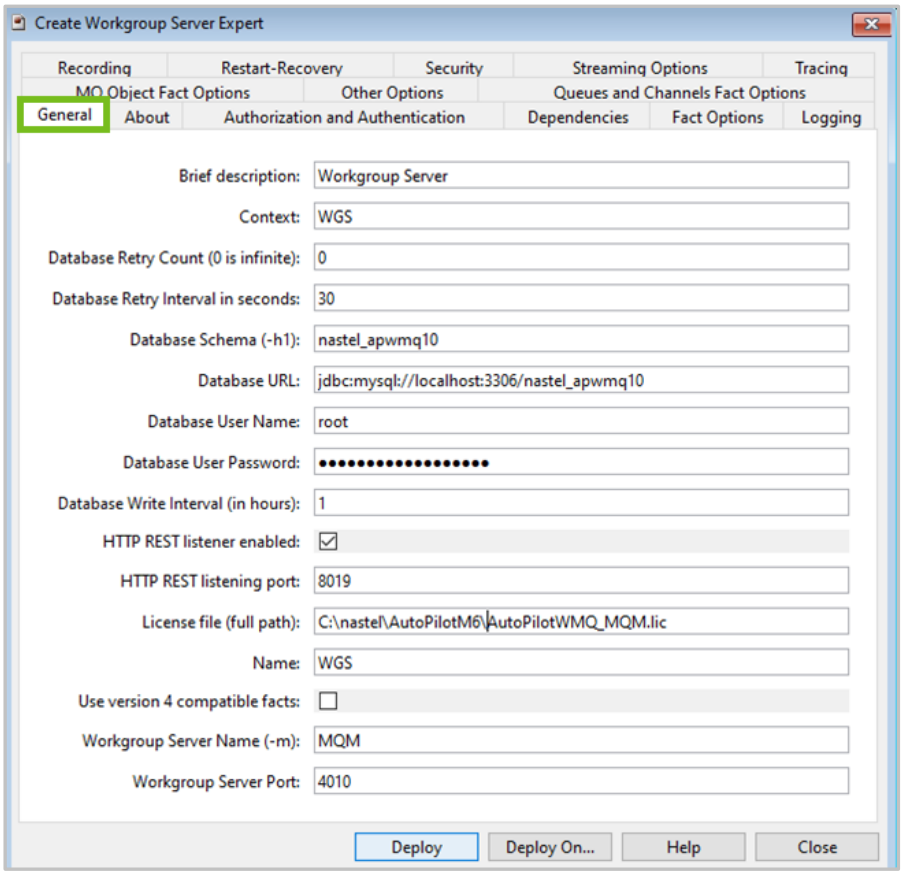

Figure 5-2. Create Workgroup Server Expert – General Tab

4. Enter data using the table below.

Table 5-1. WGS Expert Properties – General

Property	Description
Brief description	Description of the expert
Context	Context name of the expert within the CEP tree
Database Retry Count (0 is infinite)	The number of times the expert tries to connect to the database at startup to load the data. A value of 0 means the expert will keep trying to connect to the database.
Database Retry Interval in seconds	The number of seconds to wait before attempting to connect to the database after an error at startup.
Database Schema (-h1)	Schema name of the WGS database, if one exists.
Database URL	JDBC connection URL for the WGS database. Below is a list of supported database JDBC connection URLs. MYSQL: jdbc:mysql://<*host-name or IP*>:3306/nastel_apwmq ORACLE: jdbc:oracle:thin:@<*host-name or IP*>:1521:<*SID*> jdbc:oracle:thin://<*host-name or IP*>:1521/<*SERVICENAME*>

	DB2: jdbc:db2://<*host-name or IP*>:50000/M6WMQ MSSQL: jdbc:sqlserver://<*host-name or IP*>:1455;databaseName=nastel_apwmq POSTGRE: jdbc:postgresql://<*host-name or IP*>:5432/nastel_m6wmq?searchpath=nastel_m6wmq
Database User Name	WGS database username
Database User Password	WGS database user password
Database Write Interval (in hours)	How often the runtime data is written to the WGS database in hours. Will also be written to database at shutdown.
License file (full path)	If not local host, must be full path.
Name	Name of this instance
Use version 4 compatible facts	Indicates if you want version 4 or version 6 compatible fact names/values.
Workgroup Server Name (-m)	Name of the workgroup server instance that must also be in your license file.
Workgroup Server Port	The default is port 4010. Change as required.

5. Select the *About* tab. These properties are for information only and cannot be edited.

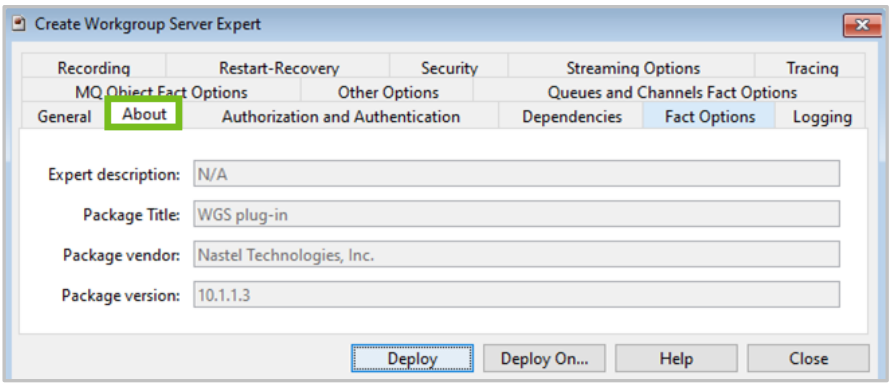

Figure 5-3. Create Workgroup Server Expert – About Tab

Table 5-2. WGS Expert Properties – About	
Property	**Description**
Package Title	Implementation title of the source package.
Package vendor	Name of implementation vendor.
Package version	Package version as assigned by the vendor.

6. Select the *Authorization and Authentication* tab. Edit properties described in the table below, as required.

Figure 5-4. Create Workgroup Server Expert – Authorization and Authentication Tab

Table 5-3. WGS Expert Properties – Authorization and Authentication

Property	Description
Permits Database Schema (-h2)	Schema name of the Permits database, if one exists.
Permits Database URL	JDBC URL of the Permits database. Below is a list of supported permit database JDBC connection URLs. MYSQL: jdbc:mysql://<*host-name or IP*>:3306/nastel_permv3 ORACLE: jdbc:oracle:thin:@<*host-name or IP*>:1521:<*SID*> jdbc:oracle:thin://<*host-name or IP*>:1521/<*SERVICENAME*> DB2: jdbc:db2://<*host-name or IP*>:50000/PERMV3 MSSQL: jdbc:sqlserver://<*host-name or IP*>:1455;databaseName=nastel_permv3 POSTGRE: jdbc:postgresql://<*host-name or IP*>:5432/nastel_permv3?searchpath=nastel_permv3
Permits Database User Name	Permits database user name.
Permits Database User Password	Permits database user password.
Options	Select one as described below:
Enable Authentication (+a2)	Enable user authentication through AutoPilot M6.
Enable Permits (+u3)	Enable Permits Version 3.
Import user groups from AP (+au)	Enable user authentication through AutoPilot M6 and import Permits.

7. Select the *MQ Object Fact Options* tab. Edit properties described in the table below, as required.

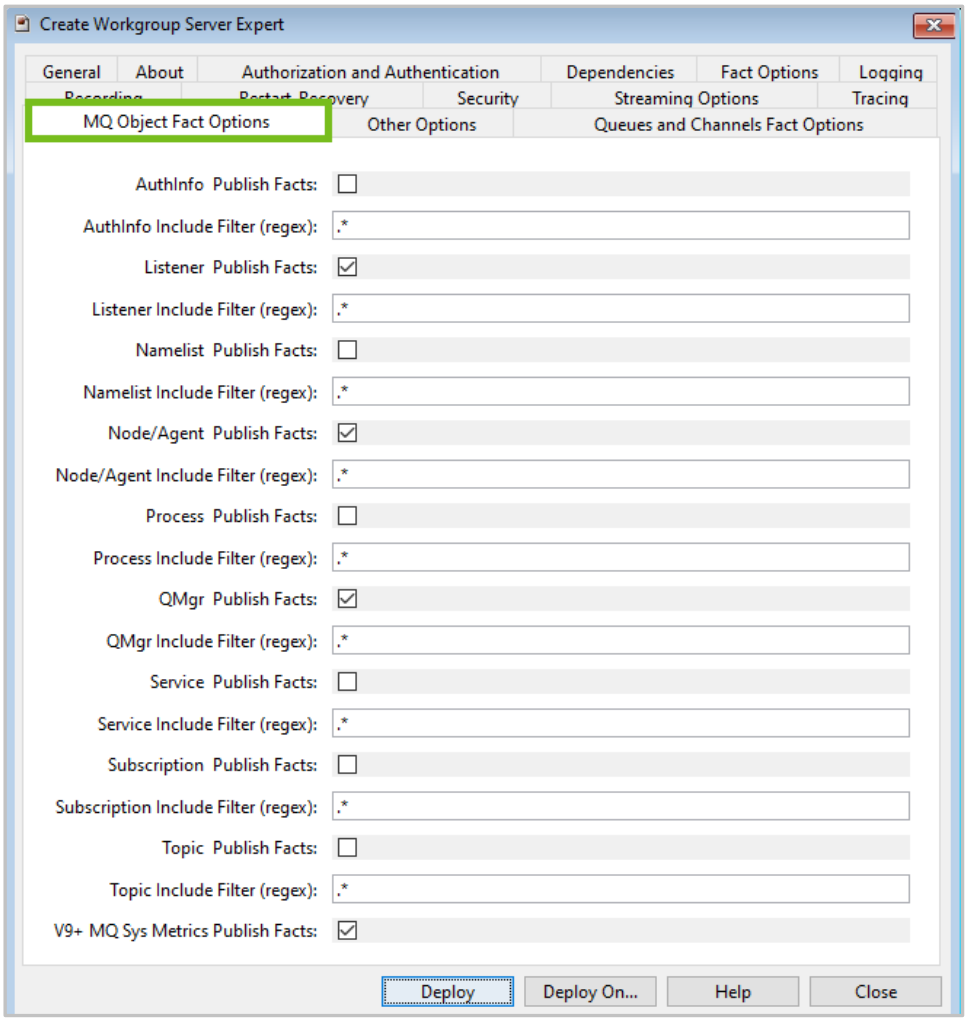

Figure 5-5. Create Workgroup Server Expert – MQ Object Fact Options Tab

Table 5-4. WGS Expert Properties – MQ Object Fact Options	
Property	**Description**
AuthInfo Publish Facts	Enable publishing of AuthInfo facts
AuthInfo Include Filter (regexp)	Regex expression of what AuthInfos to publish
Listener Publish Facts	Enable publishing of Listener facts
Listener Include Filter (regexp)	Regex expression of what Listeners to publish
Namelist Publish Facts	Enable publishing of Namelist facts
Namelist Include Filter (regexp)	Regex expression of what Namelists to publish
Node/Agent Publish Facts	Enable publishing of Node/Agent facts
Node/Agent Include Filter (regex)	Regex expression of what Node/Agent to publish
Process Publish Facts	Enable publishing of Process facts
Process Include Filter (regexp)	Regex expression of what Processes to publish
QMgr Publish Facts	Enable publishing of Queue Manager facts
QMgr Include Filter (regexp)	Regex expression of what Queue Manager to publish

Table 5-4. WGS Expert Properties – MQ Object Fact Options	
Property	**Description**
Service Publish Facts	Enable publishing of Service facts
Service Include Filter (regexp)	Regex expression of what Services to publish
Subscription Publish Facts	Enable publishing of Subscription facts
Subscription Include Filter (regexp)	Regex expression of what Subscriptions to publish
Topic Publish Facts	Enable publishing of Topic facts
Topic Include Filter (regexp)	Regex expression of what Topics to publish
V9+ MQ Sys Metrics Publish Facts	Enable publishing of MQ V9 system metrics

8. Select the *Queues and Channels Fact Options* tab. Edit properties described in the table below, as required.

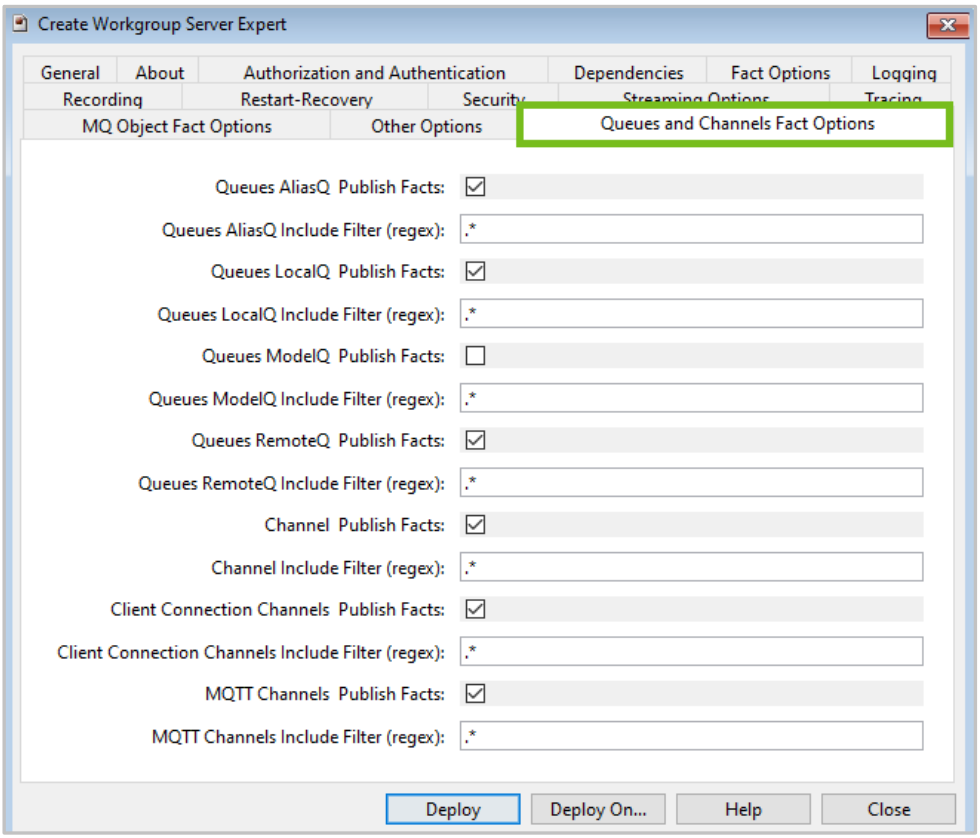

Figure 5-6. Create Workgroup Server Expert – Queues and Channels Fact Options Tab

Table 5-5. WGS Expert Properties – Queues and Channels Fact Options	
Property	**Description**
Queues AliasQ Publish Facts	Enable publishing of AliasQ facts
Queues AliasQ Include Filter (regexp)	Regex expression of what AliasQs to publish
Queues LocalQ Publish Facts	Enable publishing of LocalQ facts
Queues LocalQ Include Filter (regexp)	Regex expression of what LocalsQs to publish

Table 5-5. WGS Expert Properties – Queues and Channels Fact Options	
Property	**Description**
Queues ModelQ Publish Facts	Enable publishing of ModelQ facts
Queues ModelQ Include Filter (regexp)	Regex expression of what ModelQs to publish
Queues RemoteQ Publish Facts	Enable publishing of RemoteQ facts
Queues RemoteQ Include Filter (regexp)	Regex expression of what RemoteQs to publish
Channel Publish Facts	Enable publishing of Channel facts
Channel Include Filter (regexp)	Regex expression of what Channels to publish
Client Connection Channel Publish Facts	Enable publishing of Client Connection facts
Client Connection Channel Include Filter (regexp)	Regex expression of what Client Connections to publish
MQTT Channels Publish Facts	Enable publishing of MQTT facts
MQTT Channel Include Filter (regexp)	Regex expression of what MQTTs to publish

9. Select the *Tracing* tab. Edit properties described in the table below, as required.

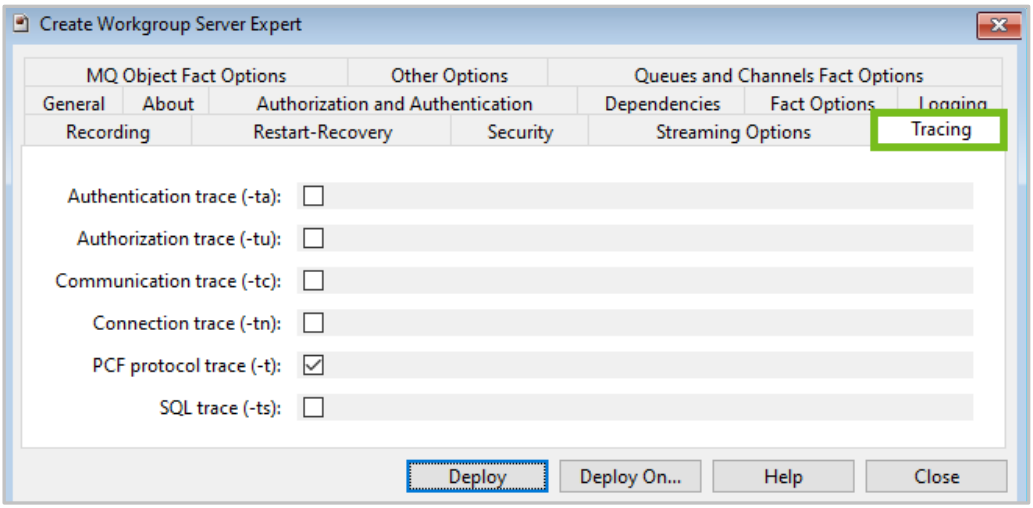

Figure 5-7. Create Workgroup Server Expert – Tracing Tab

Table 5-6. WGS Expert Properties – Tracing	
Property	**Description**
Authentication trace (-ta)	Enable/disable authentication trace.
Authorization trace (-tu)	Enable/disable authorization trace.
Communication trace (-tc)	Enable/disable communication trace.
Connection trace (-tn)	Enable/disable connection trace.
PCF protocol trace (-t)	Enable/disable PCF protocol trace.
SQL trace (-ts)	Enable/disable SQL trace.

10. To make WGS 10 log viewing easier, on the *Logging* tab, change the default **Log name** field from **services** to something like **wgs10_service_log**, to make the log name more recognizable. This log will contain only log messages for the WGS 10 service, excluding log messages for other services (experts).

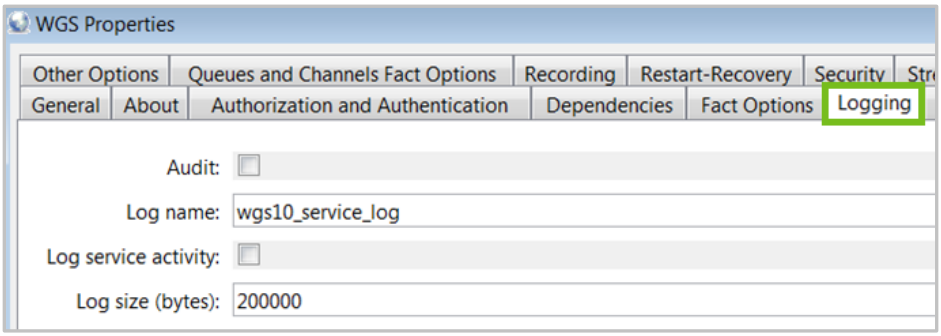

Figure 5-8. Logging

If you right click on **WGS** > **View Events**, the Event Viewer window opens. Click **Menu** > ***cep_server*_Logs** and observe that **wgs10_service_log** is one of the selectable choices.

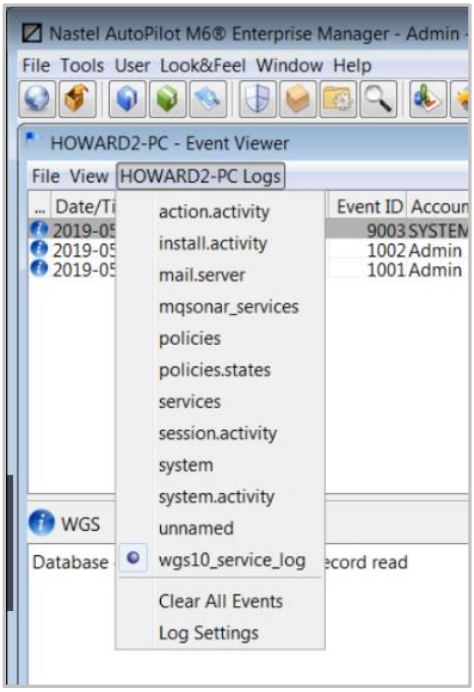

Figure 5-9. Event Viewer Menu

Select **wgs10_service_log** and you will see the WGS 10 log messages.

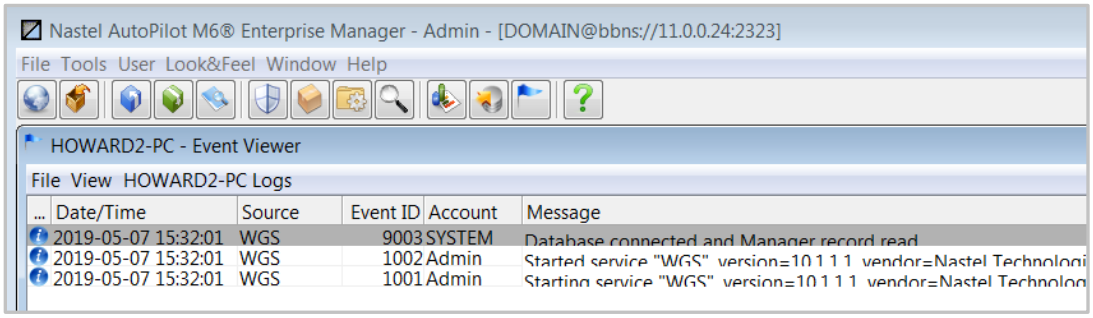

Figure 5-10. Event Viewer – WGS 10 Log Messages

11. Click **Apply**. A confirmation dialog box opens. Click **Yes** to apply and **No** to cancel. Click **Close**.

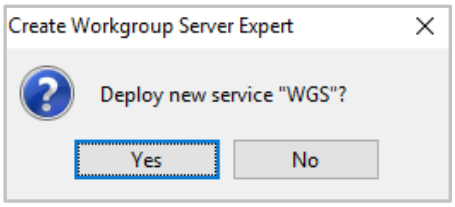

Figure 5-11. Deployment Confirmation

NOTE

The following AutoPilot tabs are not used to configure the Workgroup Server Expert: Dependencies, Fact Options, Recording, Restart-Recovery, Security, Streaming.

5.1 Workgroup Server Expert Facts

The following figures show examples of the WSE facts that will be visible in the Enterprise Management console if you configured the WSE with the various Publish Facts option boxes checked.

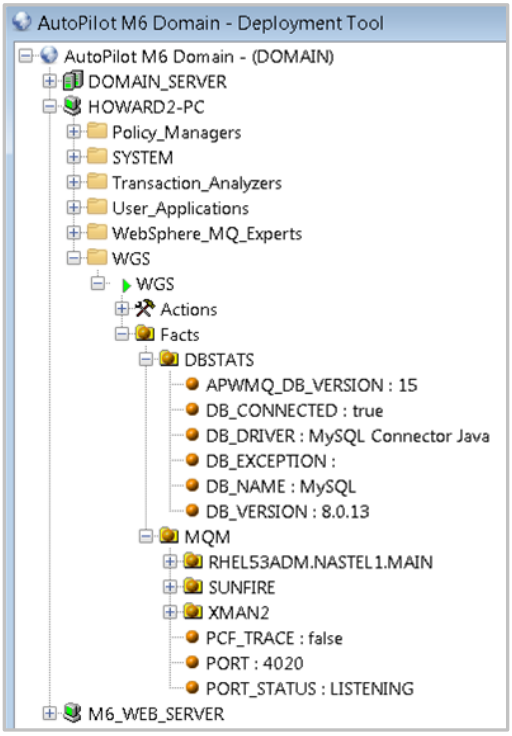

Figure 5-12. Facts for the Database and Workgroup Nodes

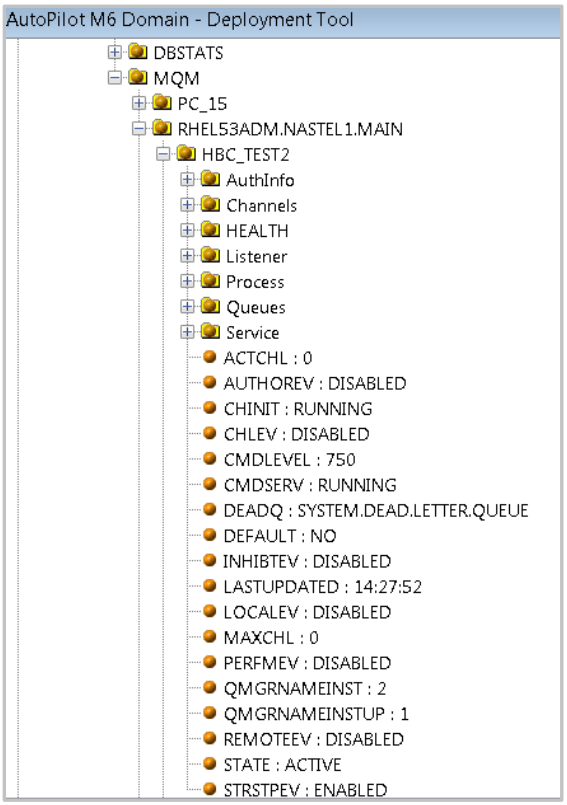

Figure 5-13. Facts for Properties of Queue Manager HBC_TEST2

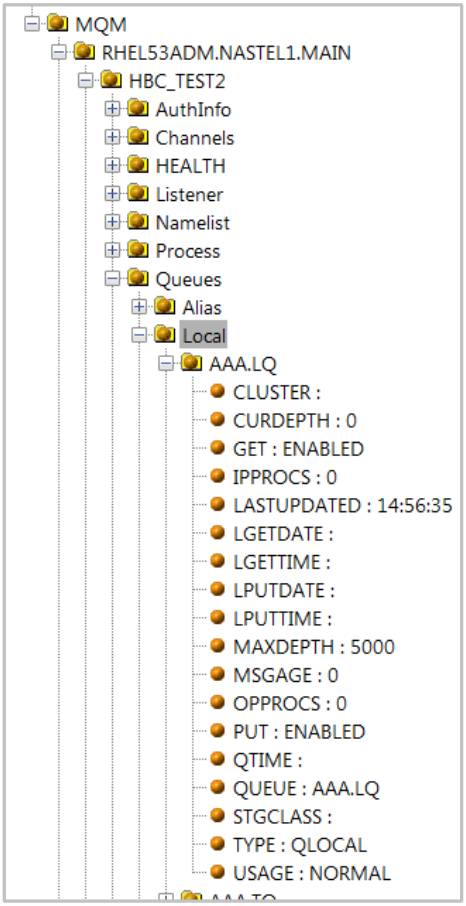

Figure 5-14. Facts for a Local Queue on Queue Manager HBC_TEST2

Chapter 6: Job Scheduler Setup for Nastel Navigator

The following steps are not required. Only perform the below if you plan on utilizing Nastel Navigator Scheduler, as this is an optional feature.

The scheduler allows tasks or jobs to be scheduled for execution by a client, such as WGS Expert, at some time in the future. These jobs can be anything that can be performed with PCF commands, such as putting a batch of end-of-market related messages on a transmit queue to be sent to a securities dealer at end of day; or defining a new channel, starting it, and then deleting it.

6.1 Requirements

- **AP60_SU28.6.pkg** or higher, available from the same media or web site from where you obtained the WGS Expert.
- Java 1.8
- MySQL


NOTE

WGS10 uses Scheduler if installed, but Scheduler does not require WGS10 (both packages are standalone).

6.2 Installation Steps

1. Install **JOB_SCHEDULER-x.x.x.pkg**. This package is available from the same media or web site from where you obtained the WGS Expert.

   a. Stop WGS Expert if running and CEP Server.

   b. Copy the package file to [*AUTOPILOT_HOME*]/updates on the server where AP M6 is installed

   c. Install using pkgman:

   `[AUTOPILOT_HOME]/bin/pkgman [AUTOPILOT_HOME]/updates/JOB_SCHEDULER-version.pkg`

   Alternatively, on a Windows system, run the package manager GUI by going to **Start** > **Nastel AutoPilot M6** > **M6 Product Maintenance**. Click **Install**, select the package in the **Updates** folder, and click **Open**.
2. Run the following two SQL files found within the directory, `AutoPilotM6/scheduler/config/db`. Currently only MySQL is supported. Run these files from the command client or MySQL Admin tool. Use database schema **nastel_apwmq** (or the similar name that you defined):
   a. **ap-sched-mysql.sql**
   b. **quartz_mysql.sql**
3. Restart CEP Server.
4. Deploy an instance of Job Scheduler to the same node where WGS10 expert is installed.

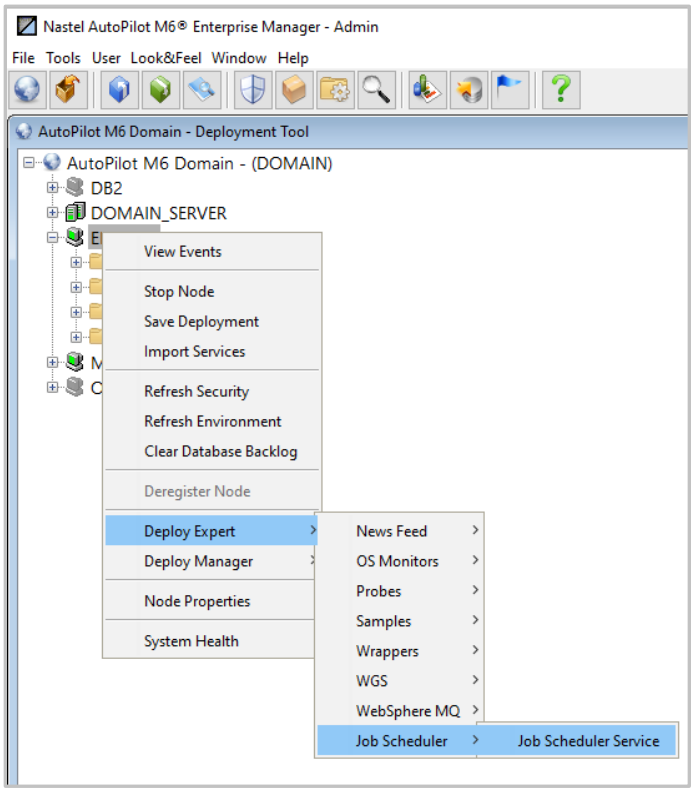

Figure 6-1. Deploy Expert Menu

a. Configure Job Scheduler database property page to use the database schema where the new tables in step 2 were created.

b. Set JDBC Driver field: com.mysql.jdbc.Driver

c. Make sure not to leave spaces when copying DB information into the DB fields: JDBC Driver, DB Logon ID, DB Password, DB Connection URL. Use the same DB properties as used when configuring the WGS Expert properties. See *Figure 5-2*.

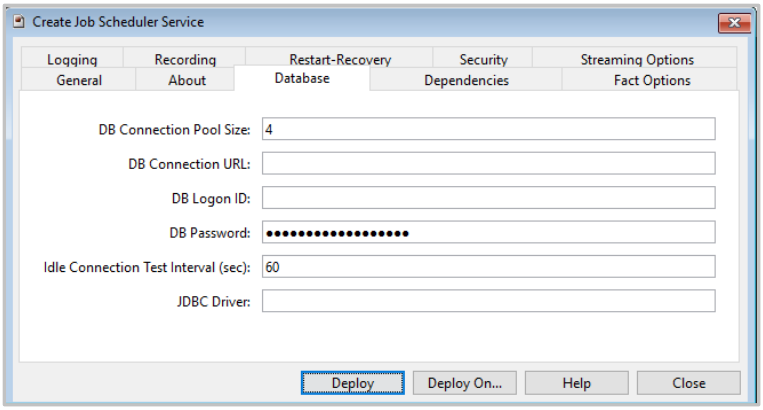

Figure 6-2. Database Tab in Job Scheduler Properties

5. Start Job Scheduler Expert
6. Start WGS10 Expert

Chapter 7: Understanding WGS 10 Fact Publishing

When publishing MQ facts with Workgroup Server 10 (WGS 10), the first thing to consider is which facts you are publishing. If you do not have sensors that use a specific object, such as namelists, do not activate facts for it. See Chapter 8, Controlling Facts Published in WGS 10, for additional discussion on that topic.

Fact Publishing Concepts

The next thing to consider is the fact publishing activity. The data published by the WGS has two main types. The first type of data to consider is status metrics which change frequently, such as queue depth, input and output open counts, channel status, sequence number, etc. These need to be frequently collected and published. The other type of data is configuration data which change infrequently or may never change. Because these two types of data behave so differently, there are two individual intervals defined and the facts they produce updated at those times. These settings can be found on the **Other Options** property tab for the WGS.

MQ Status object refresh interval controls the first, and defaults to every 30 seconds. Thus, every 30 seconds, the current status of objects will be refreshed. Thirty seconds is a good frequency for this data to ensure that updates like queue depth are up to date. There are other factors, such as events or user queries that can cause individual objects to update on demand.

MQ object refresh interval controls the second type of data and defaults to every 300 seconds. When requesting this data, the WGS sends a request to MQ asking for changes since the last interval. The default of 300 seconds is a good value to start but depends largely on how dynamic the environment is, the maximum time you are willing to wait before a change is reported, and whether changes are being made using Nastel Navigator or external tooling. Increasing the value decreases load on the MQ Server as that is the primary cost in identifying these changes. For stable environments, even once an hour may be sufficient. Actions, such as creating a queue, that are triggered by Nastel components are immediately recognized. This incremental discovery can be triggered manually if needed.

A third interval on this tab, the **fact republish rate** controls a periodic update of facts the WGS has collected. This works with the **expiry interval** to make sure that facts that are no longer available are removed. For example, if an object has been deleted, since there are no facts to publish, it will no longer be updated. As another example, if a queue manager or node is stopped, no facts other than the queue manager status are maintained in the WGS, these facts are no longer published. By default, this interval is 30 seconds, which means that for active objects, the most recent data will be published at least every 30 seconds. The fact expiry interval controls how quickly objects are removed from the published facts. The default for the expiration is 90 seconds. As an example, if a queue were deleted at time 0, its facts would stop publishing, since it no longer exists and it would be removed 90 seconds later. Ninety seconds allows for delays in update times due to system load.

Understanding Your Fact Publishing Behavior

The total number of facts published and the publishing rate are available in the CEP system metrics. To locate these facts, expand the SYSTEM folder under the CEP Server hosting the WGS. Expand ***cep-server*_Facts** > **Facts** > **Services** > ***WGS_expert_name***. A number of different metrics are published in every 30 second interval. These are several of the key metrics:

- fact_publish_rate_per_sec: rate of fact publishing during the interval (number of facts/interval time)
- facts_current: number of active facts

- facts_published: number of facts published during the interval
- facts_updated: number of published facts that were updated during the interval
- facts_created: number of new facts created during the interval
- facts_cleared: number of facts that expired during the interval

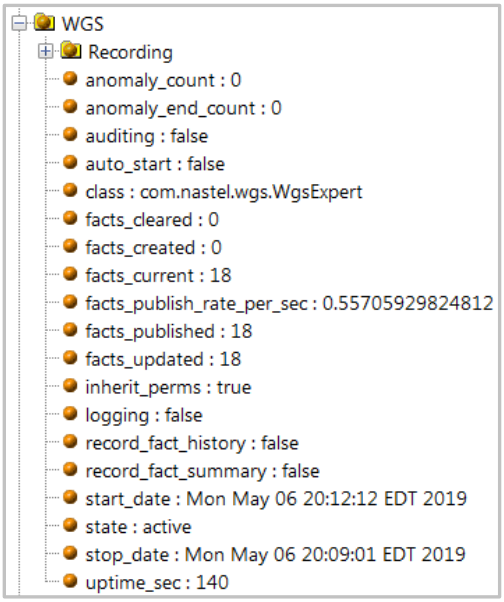

Figure 7-1. WGS Expert Metrics Facts

In addition to the current value, the derived properties can be useful to understand the behavior. To see these, left click on any fact and then move the mouse to the white space, right click and select Show Properties. This shows quite a few statistics, but the key ones for this scenario are the maximum, minimum and average values. Many of the facts are counters. The Property counter is the total number for that counter since the WGS was started. It is not required to close the properties window to select a different fact; simply click on it.

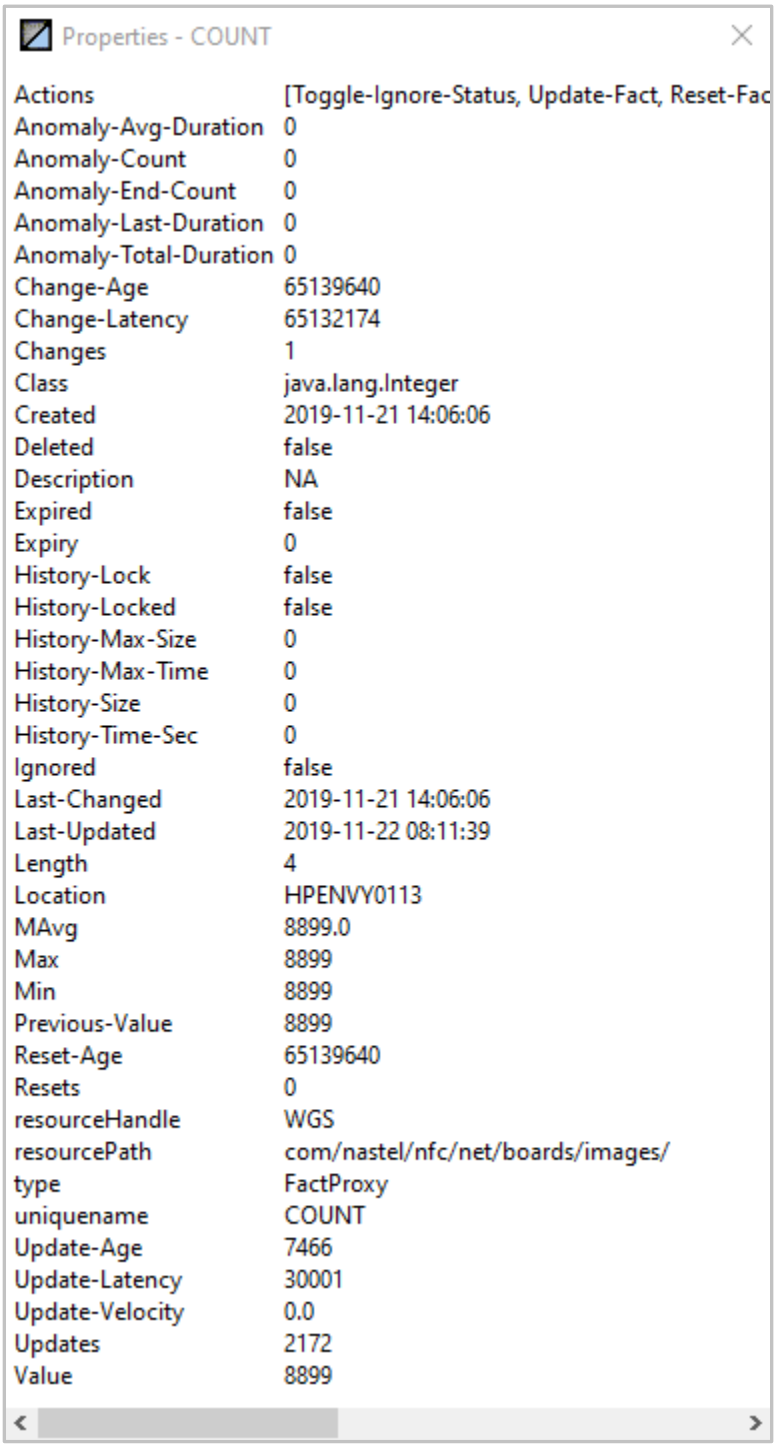

Figure 7-2. Show Properties Example

7.1 Controlling Facts Published in WGS10

If you are seeing too many facts in WGS 10, they be reduced as explained below. There is no impact on viewing the data; only facts not typically needed are removed.

On the WGS properties, turn off any publishing for data that are not evaluated in any of your policies. If using the default policies, the following are not needed:

Authinfo, Namelist, Process, Subscriptions, Topics, ModelQ, Client Connection Channels, MQTT Channels

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Chapter 8: Troubleshooting

WGS Expert DBStatus shows DB_Exception: Access denied for user xxx@localhost (using password: YES)

Check/modify the WGS Expert properties, the **Database User Name** and **Password** fields on the **General** and **Authorization and Authentication** tabs. Click **Apply**, click **Yes** for the **Deploy to WGS** prompt box, and click **Close**.

Restart WGS Expert if it is stopped. Facts should now appear under fact categories DBStats and *workgroup_name*.

CEP Server log (or ATPNODES console) shows repeating SSL related error message

This error message appears repeatedly approximately every 30 seconds:

```
2019-05-06 18:32:36,815 ERROR[nastel.console] - Mon May 06 18:32:36 EDT 2019
WARN: Establishing SSL connection without server's identity verification is not
recommended. According to MySQL 5.5.45+, 5.6.26+ and 5.7.6+ requirements SSL
connection must be established by default if explicit option isn't set. For
compliance with existing applications not using SSL the verifyServerCertificate
property is set to 'false'.  You need either to explicitly disable SSL by
setting useSSL=false, or set useSSL=true and provide truststore for server
certificate verification.
```

In this scenario, perform the following:

a) Modify the WGS Expert properties. In the Database URL fields on the **General** and **Authorization and Authentication** tabs, append the URL parameter string **?useSSL=false**. Click **Apply**, click **Yes** for the **Deploy to WGS** prompt box, and click **Close**. Restart WGS Expert if it is stopped.

b) Disable use of SSL in MySQL 8:

Stop the CEP Server (atpnode process). In MySQL Workbench, select **Menu** > **Database** > **Manage Connections**. Select the connection being used in the MySQL Connections panel, select tab **Connection** > **SSL**. Change field **Use SSL** to **No**. Click **Test Connection** and you should see a popup showing "Successfully made the MySQL connection" and "SSL: not enabled". Click **Close** on the **Connection** tab. Restart the CEP Server (atpnode).

WGS Expert fails to manage nodes due to license problem

Messages such as these might appear in the `[AUTOPILOT_HOME]\logs\log4j\`*`cep_server_name`*`.log4j`:

```
2019-05-06 22:24:00,422 ERROR[WGSExpert][WsExpertThread] - Error starting
scheduling.  That component might not work
2019-05-06 22:24:00,449 ERROR[WGSExpert][ConnectionPool_for_SUNFIRE] - Failed
to get license for node 'SUNFIRE' with 2 CPU & 0 MIPs
```

Check the CPU Count in your license file `[AUTOPILOT_HOME]\localhost\AutoPilotWMQ_MQM.lic`

a) If the CPU Count is less than the total core count for all your managed MQ and EMS nodes, you will not be able to manage those nodes whose core counts cause the license limit to be exceeded.

b) If you installed **WGSRP-10.1.1.pkg**, an AutoPilot license with CPU Count: 0 was installed. No MQ or EMS nodes can be managed with this license.

Request a license file from Nastel support that has a valid user count.

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Appendix A: References

This appendix contains a list of reference material and documents relevant to Nastel Navigator. The documents can be found in the Resource Center.

A.1 Nastel Documentation

Table A-1. Nastel Documentation

Document Number (or higher)	Title
M6MW-ADM 660.002	*Nastel AutoPilot M6 for Middleware V6.6 - Administrator's Guide*
M6MW-INS 664.003	*Nastel AutoPilot M6 for Middleware V6.6 - Installation Guide*
M6MW/SM 660.001	*Nastel AutoPilot for Middleware Security Manager V6.6 - User's Guide*
M6WMQ-WMM 661.002	*Nastel Navigator Classic (apodwmq) V6.6 - User's Guide*
M6/MQ 600.005	*AutoPilot® M6 Plug-in for IBM MQ*
APM6/INS 625.002	*AutoPilot M6 Installation Guide*
APM6/USR 625.003	*AutoPilot M6 User's Guide*

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Appendix B: Conventions

B.1 Typographical Conventions

Table B-1. Typographical Conventions

Convention	Description
Blue/Underlined	Used to identify links to referenced material or websites. Example: support@nastel.com
Bold Print	Used to identify topical headings, glossary entries, and toggles or buttons used in procedural steps. Example: Click **EXIT**.
Italic Print:	Used to place emphasis on titles, menus, screen names, or other categories.
Monospaced Bold	Used to identify keystrokes/data entries, file names, directory names, etc.
Monospaced Italic	Used to identify variables in a directory path or a command line. Example: [*AUTOPILOT_HOME*]\documents. Where the portion of the address in the brackets [ ] is variable.
Monospaced Text	Used to identify addresses, commands, script etc.
Normal Text	Typically used for general text throughout the document.
Table Text	Table text is generally a smaller size to conserve space. 10, 9, and 8 point type is used in tables throughout AutoPilot M6 product family of documents.

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